Technical Memorandum

APTIM

Review of Technical Memorandum
Sub-Slab Vapor, Indoor Air and Outdoor Air Sampling
Property 16, Pre-Design Investigation
Soil and NAPL Operable Unit
Del Amo Superfund Site, dated May 15, 2018

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1.0 INTRODUCTION

Aptim Federal Services, LLC (APTIM) conducted a review of the *Technical Memorandum, Sub-Slab Vapor, Indoor Air and Outdoor Air Sampling, Property 16, Pre-Design Investigation, Soil and NAPL Operable Unit, Del Amo Superfund Site, California,* dated May 15, 2018 (Tech Memo), prepared by AECOM (2018a). APTIM also reviewed the associated Data Validation Memoranda (AECOM, 2018b and 2017).

The objective of the Tech Memo reported results of two investigations completed as part of the predesign investigation for soil-vapor extraction (SVE), based on sub-slab samples collected beneath Property 16 (LSC Communications, Inc., formerly R.R. Donnelley) and collected in indoor air and outdoor air. The Tech Memo superseded AECOM's previous Tech Memo dated February 7, 2018, which was limited to summarizing findings for Summer 2017 (initial) sampling event. The February Tech Memo concluded that remediation action (e.g., implementation of SVE) beneath Property 16 is not required.

2.0 REVIEW

APTIM reviewed the Tech Memo (AECOM, 2018a) and associated Data Validation Memoranda (AECOM, 2018b and 2017) to determine the completeness of the data set, if data were collected in the correct locations using appropriate sampling techniques, if the appropriate cleanup levels were applied, and if Tech Memo conclusions were appropriate. APTIM also performed a cursory evaluation of split (duplicate) sample results collected by U.S. Environmental Protection Agency (EPA) for three of the sub-slab samples and three of the air samples during the summer event, and one of the outdoor air samples, three of the sub-slab samples, and two of the indoor air samples during the winter event (not discussed in the AECOM Tech Memo).

2.1 Collection Methods and Sample Locations

Seven sub-slab samples were collected beneath the existing building on Property 16 on September 29 and October 3, 2017, and on March 7, 2018, as well as two outdoor (ambient) air samples during both summer and winter events along the western side of the building to establish background conditions. Five field duplicate sub-slab samples were also collected by AECOM during the summer event, and the Data Validation Memorandum (AECOM, 2017) stated the precision between the sample and field duplicates was acceptable except for two volatile organic compounds (VOCs) where the relative percent difference (RPD) was not acceptable. The RPD criterion of 100 percent (%) was exceeded for tetrachloroethene (PCE) (125%) and for trichloroethene TCE (103%). Two field duplicate sub-slab samples were also collected by AECOM during the winter event, and the Data Validation Memorandum (AECOM, 2018b) states the precision between the sample and field duplicates was acceptable.

Vapor Pin® technology was used to collect the sub-slab samples, while indoor air and outdoor air sampling used Summa canisters. All sub-slab samples were analyzed using either EPA Method TO-15 or Method TO-15 SIM (Selected Ion Monitoring).

Three of the sub-slab locations and three of the air samples were sampled by EPA during the summer event for analysis by the EPA Region 9 Laboratory. Results fluctuated considerably; however, in general, the split-sample results were similar to the original sample results, particularly for the VOCs with elevated concentrations. One of the outdoor air samples, three of the sub-slab samples, and two of the indoor air samples were sampled by EPA during the winter event for analysis by the EPA Region 9 Laboratory. Results fluctuated considerably; however, in general, the split-sample results were similar to the original sample results, particularly for the VOCs with elevated concentrations.

The seven sub-slab samples, as shown on Figure 8 of the Tech Memo (AECOM, 2018a), appear to have generally been collected in appropriate locations, as they are near historical sub-slab

sample results from 2009 that had elevated concentrations, or targeted other areas of the building that had not previously been investigated.

Sub-slab leak testing prior to sample collection was completed in general accordance with the Field Sampling Plan. Field documentation is included in Attachment 2 of the Tech Memo (AECOM, 2018a).

2.2 Memo Text, Tables and Figures

The following comments are provided based on the information presented in Tech Memo text, tables, and figures:

Text

1. Page numbers should be added.
2. A reference list should be added to the report, and include all cited material, including citations and dates of publication for Department of Toxic Substances Control screening levels and EPA regional screening levels.
3. An uncertainty section should be added to the report that discusses any of the detection limits presented for nondetect results that exceeded action levels/cleanup goals. This should also include chemicals that were 100% nondetect and thus are not listed in the "detected" chemical summary tables.
4. Section 2.3. Text states that vacuum readings and total organic vapor concentrations were recorded hourly over the duration of the sampling period. These data should be included in an attachment and discussed.
5. Section 3.1, 1st paragraph, 3rd line: Please revise sentence as "Ambient/outside air concentrations may contribute to…"
6. Section 3.2, 2nd paragraph, 5th line: Text states that sub-slab vapor concentrations were generally comparable between summer and winter events. Please revise to say "Sub-slab vapor concentrations were generally greater in the summer event, with approximately 20 percent of the concentrations increasing in the winter event (based on inspection of the sample pair results presented on Figure 8)."
7. Section 3.3.3, 1st paragraph, last line: Please add the following, "In addition, the maximum sub-slab carbon tetrachloride detection limit for a non-detect result was 31 $\mu g/m^3$, which was considerably below the action level of 264 $\mu g/m^3$ (Attachment 1)."
8. Section 3.3.3, 3rd paragraph, 3rd sentence. Please revise as follows: "The benzene exceedance concentrations (1.7 to 2.3 $\mu g/m^3$) are not considered significant or indicative of vapor intrusion given that they only slightly exceed background levels

(0.81 to 1.8 µg/m^3 based on outdoor air concentrations) and that sub-slab vapor benzene concentrations are more than an order of magnitude below action levels (Table 2).

9. Section 3.3.3, 6th paragraph (bullet 1). Please generate and include a new table in the Tech Memo that presents a detailed comparison of the ratios of PCE and TCE in sub-slab samples and 12-hour indoor air samples (using only data pairs where both results were detected). Use of only exceedance histograms (Figure 11) for a discussion on correlation is an incomplete approach. Important information related to the actual ratio of PCE vs. TCE concentrations in 12-hour indoor air samples compared with sub-slab samples is missing. For example, ratios of PCE to TCE (for eight of the higher concentrations) ranged from approximately 0.6 to 2 in the sub-slab samples, but ranged from approximately 1.5 to 57 in 11 of the indoor air samples with elevated concentrations. Mean PCE:TCE ratios of approximately 1.1 and 21, respectively, for sub-slab samples and indoor air samples were estimated.

   This type of ratio information would more clearly show how much greater the PCE concentrations were in indoor air as compared with sub-slab samples, relative to TCE concentrations.

10. Section 4.0. Information from the data validation report, particularly related to the RPD excursions found for PCE and TCE (see Section 2.1 above), should be added.

11. Section 5.0. A conclusion that vapor intrusion (VI) is not occurring is generally supported by the data. Although elevated concentrations of PCE were measured in sub-slab samples, and PCE was also detected in indoor air at concentrations above background (ambient) outdoor air and above the action level, the use of PCE-containing products by current indoor workers is clearly the primary source of PCE measured in indoor air.

    There is a slight concern this indoor activity may be masking some PCE VI. Based on the very elevated concentrations of PCE in some sub-slab samples, VI may be occurring and might be apparent in the future, if current sources of PCE used by workers were eliminated, the facility was cleaned, and a new tenant moved into the building. However, TCE has not been measured at elevated concentrations in indoor air. Given the similarity in sub-slab PCE and TCE sample concentrations, the fact that TCE is relatively low in indoor air argues against significant VI. Therefore, EPA agrees with a conclusion of no further action.

Tables

1. No comments.

Figures

1. Figure 11. This figure shows some TCE exceedances in indoor air; however, Table 4 shows no TCE exceedances. If indoor air grab sample results (in addition to 12-hour indoor air samples) have been used, this should be clarified on the figure.
2. Figure 11. Please add "SN" to figure Legend for the sample taken at night during the summer investigation.

2.3 Cleanup levels

The action levels/cleanup goals presented in the tables were spot-checked, and based on this cursory review, appear to be correct and match the values presented in the Record of Decision (EPA, 2013) or calculated using industrial air regional screening levels divided by the attenuation factor of 0.0011, rounded to 1 or 2 significant figures.

It is important to note that Section 12.2 of the Record of Decision (EPA, 2013) states the following:

> *This action level can be adjusted to incorporate other VOC constituents besides these, if found during additional remedial design sampling to exceed the risk levels and require action where the above had not require action. In such cases, the action level for all VOC contaminants combined would be a cumulative risk of one in one million excess cancer risk or hazard index greater than 1 for an industrial/commercial use exposure scenario.*

Based on this information, tables should be revised to include information to estimate the cumulative cancer risks and cumulative non-cancer hazards for the detected VOCs in order to conservatively assume exposure to more than just one VOC at a time. While this information will not change report conclusions, it will make the report more complete.

3.0 CONCLUSIONS

The previously discussed issues in Section 2 should be addressed in a revised AECOM Tech Memo.

4.0 REFERENCES

AECOM, 2018a, *Technical Memorandum, Sub-Slab Vapor, Indoor Air and Outdoor Air Sampling, Property 16, Pre-Design Investigation, Soil and NAPL Operable Unit, Del Amo Superfund Site*, Memo from AECOM to Anhtu Nguyen, USEPA, May 15.

AECOM, 2018b, *Data Validation Memorandum, Summary of Data Validation for Eurofins/CalScience Reports: 18-03-0118 and 18-03-0580, Del Amo Superfund Site*, Memo from Lily Bayati, Senior Project Chemist to Julie Doane-Allmon, May 2.

AECOM, 2017, *Data Validation Memorandum, Summary of Data Validation for Eurofins/CalScience Reports: 17-09-2204, 17-09-2359, and 17-10-0090, Del Amo Superfund Site*, Memo from Lily Bayati, Senior Project Chemist to Julie Doane-Allmon, November 16.

U.S. Environmental Protection Agency, 2013, *Record of Decision (ROD), Soil and NAPL Operable Unit, Del Amo Superfund Site, Los Angeles, California*, Revised July 26.